# Contents

### Volume 37, Number 1, 25 January 2006

### **Original articles**

- 1 An evaluation of the role and impacts of alien finfish in Asian inland aquaculture S S De Silva, T T T Nguyen, N W Abery and U S Amarasinghe
- 18 Development of two cell culture systems from Asian seabass Lates calcarifer (Bloch) W S Lakra, N Sivakumar, M Goswami and R R Bhonde
- 25 Influence of insoluble dietary cellulose on digestive enzyme activity, feed digestibility and survival in the red claw crayfish, Cherax quadricarinatus (von Martens)
  A Pavasovic, N A Richardson, P B Mather and A J Anderson
- 33 Cage culture of sutchi catfish, Pangasius sutchi (Fowler 1937): effects of stocking density on growth, survival, yield and farm profitability M M Rahman, M S Islam, G C Halder and M Tanaka
- 40 Partial and total replacement of fishmeal with poultry by-product meal in diets for gibel carp, Carassius auratus gibelio Bloch Y Yang, S Xie, Y Cui, X Zhu, W Lei and Y Yang
- 49 Intra- and interspecific phenotypic characteristics of fish-pathogenic Edwardsiella ictaluri and E. tarda V S Panangala, C A Shoemaker, S T McNulty, C R Arias and P H Klesius
- 61 Electrical stunning followed by decapitation or chilling of African catfish (Clarias gariepinus): assessment of behavioural and neural parameters and product quality B Lambooij, K Kloosterboer, M A Gerritzen, G André, M Veldman and H Van De Vis
- 71 Effects of triploidy on feed efficiency, morphometric indexes and chemical composition of shi drum, Umbrina cirrosa L. S Segato, D Bertotto, L Fasolato, A Francescon, A Barbaro and A Corato
- 78 Interference of Listonella anguillarum with potential probiotic microorganisms isolated from farmed gilthead seabream (Sparus aurata, L.)
  M Chabrillón, S Arijo, P Díaz-Rosales, M C Balebona and M A Moriñigo
- 87 Effects of rearing density on growth, brain neurotransmitters and liver fatty acid composition of juvenile white sea bream Diplodus sargus L.
  S E Papoutsoglou, N Karakatsouli, G Pizzonia, C Dalla, A Polissidis and Z Papadopoulou-Daifoti
- 96 Changing of fat content and fatty acid profile of reared pike (Esox lucius) fed two different diets B Kucska, L Pál, T Müller, M Bódis, Á Bartos, L Wágner, F Husvéth and M Bercsényi

# **Short communications**

- 102 Effects of different levels of fish protein hydrolysate in the diet on the nonspecific immunity of Japanese sea bass, Lateolabrax japonicus (Cuvieret Valenciennes, 1828) M Liang, J Wang, Q Chang and K Mai
- 107 Effect of dietary protein and lipid levels on feed intake and growth performance of southern catfish, Silurus meridionalis Chen S-J Fu and Z-D Cao

## **Book review**

111 A New Key to the Freshwater Bryozoans of Britain, Ireland and Continental Europe M C M Beveridge

# Volume 37, Number 2, 7 February 2006

- 113 Effects of single and combined microalgae on larval growth, development and survival of the commercial sea cucumber Holothuria spinifera Theel P S Asha and P Muthiah
- 119 Determination of physical behaviour of feed pellets in Mediterranean water P Vassallo, A M Doglioli, F Rinaldi and I Beiso

- 127 Influence of β-hydroxy-β-methylbutyrate on nonspecific humoral defense mechanisms and protection against furunculosis in pikeperch (Sander lucioperca) A K Siwicki, Z Zakęś, J C Fuller Jr, S Nissen, S Trapkowska, E Glabski, A Kowalska, K Kazuń and E Terech-Majewska
- 132 Effects of addition of a bird repellent to fish diets on their growth and bioaccumulation S Harpaz and L Clark
- 139 Effect of temperature on sex ratio in guppy Poecilia reticulata (Peters 1860) i Karayücel, O Ak and S Karayücel
- 151 Exploring the trophic structure in organically fertilized and feed-driven tilapia culture environments using multivariate analyses
  P N Muendo, A Milstein, A A van Dam, E-N Gamal, J J Stoorvogel and M C J Verdegem
- 164 A new approach to kelp mariculture in Chile: production of free-floating sporophyte seedlings from gametophyte cultures of Lessonia trabeculata and Macrocystis pyrifera R Westermeier, D Patiño, M Ines Piel, I Maier and D G Mueller
- 172 Comparative study of growth performance of three strains of Nile tilapia, Oreochromis niloticus, L. at two stocking densities
  M T Ridha
- 180 Efficacy of an equal blend of canola oil and poultry fat as an alternate dietary lipid source for Atlantic salmon (Salmo salar L.) in sea water. I: effects on growth performance, and whole body and fillet proximate and lipid composition D A Higgs, S K Balfry, J D Oakes, M Rowshandeli, B J Skura and G Deacon
- 192 Efficacy of an equal blend of canola oil and poultry fat as an alternate dietary lipid source for Atlantic salmon (Salmo salar L.) in seawater. II: effects on haematology and immunocompetence S K Balfry, J Oakes, M Rowshandeli, G Deacon, B J Skura and D A Higgs

- 200 Production of monosex male guppy, Poecilia reticulata, by 17α-methyltestosterone F Turan, Ş Çek and E Atik
- 204 Bacteria or commercial diet: the preferences of Litopenaeus vannamei O Schneider, T Le Cong, V Sereti, J W Schrama, E H Eding and J A J Verreth

# Volume 37, Number 3,15 February 2006

- 209 Low-density silver carp Hypophthalmichthys molitrix (Valenciennes) polyculture does not prevent cyanobacterial off-flavours in channel catfish Ictalurus punctatus (Rafinesque) C S Tucker
- 215 Sperm motility in the steelhead Oncorhynchus mykiss (Walbaum): influence of the composition of the incubation and activation media
  J Woolsey, M Holcomb, J G Cloud and R L Ingermann
- 224 Effects of crushed conspecifics on growth and survival of Penaeus monodon Fabricius post larvae B T Nga, M Lürling, E Peeters, R Roijackers, M Scheffer and T T Nghia
- 233 Allozyme variation of hatchery and river populations of rohu (Labeo rohita, Hamilton) in Bangladesh Md. M R Khan, M S Alam and M M H Bhuiyan
- 241 The potential of mixed culture of genetically improved farmed tilapia (*Oreochromis niloticus*) and freshwater giant prawn (*Macrobrachium rosenbergii*) in periphyton-based systems S Uddin, M Ekram-Ul-Azim, A Wahab and M C J Verdegem
- 248 Reaction of common carp (Cyprinus carpio, L.) to oxygen deficiency in winter as an example for the suitability of radio telemetry for monitoring the reaction of fish to stress factors in pond aquaculture C Bauer and G Schlott
- 255 Growth performance and body composition of white seabream (*Diplodus sargus*) juveniles fed diets with different protein and lipid levels
  R O A Ozorio, L M P Valente, P Pousao-Ferreira and A Oliva-Teles
- 264 Artificial spawning of female Lithuanian strain B carp (Cyprinus carpio L.) after treatment with carp pituitary homogenate, Ovopel or [b-Tle<sup>6</sup>, ProNHEt<sup>9</sup>] GnRH-a (Lecirelin)
  E Brzuska

- 272 Comparative utility of egg blastomere morphology and lipid biochemistry for prediction of hatching success in Atlantic cod, Gadus morhua L.
  R W Penney, P L Lush, J Wade, J A Brown, C C Parrish and M P M Burton
- 284 Non-gelatinized corn supplemented with α-amylase at sub-optimum protein level enhances the growth of Labeo rohita (Hamilton) fingerlings S Kumar, N P Sahu, A K Pal, D Choudhury and S C Mukherjee
- 293 Effect of partial and total replacement of fish, shrimp head, and soybean meals with red crab meal Pleuroncodes planipes (Stimpson) on growth of white shrimp Litopenaeus vannamei (Boone) H Villarreal, R Civera-Cerecedo and A Hernandez-Ilamas

- 299 Detection of off-flavour in channel catfish (Ictalurus punctatus Rafinesque) fillets by trained dogs R A Shelby, L J Myers, K K Schrader and P H Klesius
- 302 Gonadal development in hybrids of Mediterranean sparids: Sparus aurata (female) × Pagrus pagrus (male)
  M Pavlidis, L Kokokiris, M Paspatis, S Somarakis, M Kentouri and P Divanach
- 306 Does malpigmentation improve growth in juvenile turbot (Scophthalmus maximus Rafinesque) and halibut (Hippoglossus hippoglossus L.)?
  A K Imsland, T Wergeland, T M Jonassen and S O Stefansson
- 313 Compensatory growth of group-held gibel carp, Carassius auratus gibelio (Bloch), following feed deprivation
  Z H Cui, Y Wang and J G Qin

# Volume 37, Number 4,1 March 2006

#### **Review article**

319 Selective breeding for the hybrid striped bass (Morone chrysops, Rafinesque × M. saxatilis, Walbaum) industry: status and perspectives A F Garber and C V Sullivan

- 339 A comparison of three land-based containment systems for use in culturing green sea urchins, Strongylocentrotus droebachiensis (Müller) (Echinodermata: Echinoidea) T L Daggett, C M Pearce and S M C Robinson
- 351 Vibrios associated with Macrobrachium rosenbergii (De Man, 1879) larvae from three hatcheries on the Indian southwest coast N S Jayaprakash, V J R Kumar, R Philip and I S B Singh
- 359 Apparent digestibility of some nutrient sources by juvenile mud crab, Scylla serrata (Forskal 1775) V-a Tuan, A Anderson, J Luong-van, C Shelley and G Allan
- 366 Effects of dietary supplementation with feeding stimulants on yellowtail Seriola quinqueradiata (Temminck & Schlegel; Carangidae) protein digestion at low water temperatures P Y Morimoto Kofuji, H Hosokawa and T Masumoto
- 374 Production of interploid triploids by 4n×2n blunt snout bream (Megalobrama amblycephala. Yih) and their first performance data
  S-F Li, S-M Zou, W-Q Cai and H-Y Yang
- 380 Characterization of cellulase-producing bacteria from the digestive tract of tilapia, *Oreochromis mossambica* (Peters) and grass carp, *Ctenopharyngodon idella* (Valenciennes) S Saha, R N Roy, S K Sen and A K Ray
- 389 Comparison of food selection and growth performance of koi carp, Cyprinus carpio L., and goldfish, Carassius auratus (L.) in mono- and polyculture rearing in tropical ponds P Jha, K Sarkar and S Barat
- 398 Effects of temperature, stocking density and diet on the growth and survival of juvenile Mithraculus forceps (A. Milne Edwards, 1875) (Decapoda: Brachyura: Majidae)
  G Penha-Lopes, A L Rhyne, J Lin and L Narciso
- 409 Effects of repeated handling, with or without anaesthesia, on feed intake and growth in juvenile rainbow trout, Oncorhynchus mykiss (Walbaum) P Hoskonen and J Pirhonen

- 416 Influence of dietary protein levels on growth and egg quality in broodstock female bagrid catfish (Mystus nemurus Cuv. & Val.)
  M Z Abidin, R Hashim and A C Shu Chien
- 419 Mouth and fin deformities in common carp: is there a genetic basis? M Kocour. O Linhart and M Vandeputte
- 423 Induced spawning in common sole (Solea solea L.)

  D Bertotto, J Barbaro, A Francescon, J Richard, A Libertini and A Barbaro

#### **Book review**

428 Selection and Breeding Programs in Aquaculture K Overturf

# Volume 37, Number 5, 22 March 2006

- 431 Effects of 7,12-dimethylbenz(a)anthracene on growth and haematological parameters in Korean rockfish, Sebastes schlegeli (Hilgendorf)

  J-H Jee, K Ha Park, Y-H Keum and J-C Kang
- 443 Case study on eye abnormalities in tank-reared hybrid walleyes (Sander vitreus × S. canadensis) M Ann Garcia-Abiado, M Penn and K Dabrowski
- 449 Heterogeneity of sediments and settling particles in aerated ponds J Kassila and J Hussenot
- 466 Evaluation of growth and dressing out parameters of experimental scaly crossbreds in 3-year-old common carp (Cyprinus carpio, Linnaeus 1758)
  H Buchtová, Z Svobodová, M Kocour and J Velíšek
- 472 Secondary stress responses in Indian major carps Labeo rohita (Hamilton), Catla catla (Hamilton) and Cirrhinus mrigala (Hamilton) fry to increasing packing densities N Chatteriee, A K Pal, T Das, M S Mohammed, K Sarma, G Venkateshwara and S C Mukherjee
- 477 Effects of partial and complete replacement of freshwater shrimp meal (Caridinea niloticus Roux) with a mixture of plant protein sources on growth performance of Nile tilapia (Oreochromis niloticus L.) in fertilized ponds
  D M Liti, H Waidbacher, M Straif, R K Mbaluka, J M Munguti and M M Kyenze
- 484 Gonadal development, aromatase activity and P450 aromatase gene expression during sex inversion of protogynous red-spotted grouper Epinephelus akaara (Temminck and Schlegel) after implantation of the aromatase inhibitor, fadrozole
  G-L Li, X-C Liu, Y Zhang and H-R Lin
- 492 Litopenaeus vannamei (Boone) post-larval survival related to age, temperature, pH and ammonium concentration
  F J Magallón Barajas, R Servín Villegas, G Portillo Clark and B López Moreno
- 500 Dietary levamisole modulates the immune response and disease resistance of Asian catfish Clarias batrachus (Linnaeus)
  J Kumari and P K Sahoo
- 510 Effect of feeding frequency on growth, survival and feed utilization in fingerlings of Catla catla (Hamilton), Labeo rohita (Hamilton) and Cirrhinus mrigala (Hamilton) in outdoor rearing systems G Biswas, J Krushna Jena, S Kumar Singh and H Krushna Muduli
- 515 Experimental evaluation of co-culture of juvenile sea cucumbers, Holothuria scabra (Jaeger), with juvenile blue shrimp, Litopenaeus stylirostris (Stimpson)
  S W Purcell, J Patrois and N Fraisse
- 523 Spermatophore cryopreservation and artificial insemination of black tiger shrimp, Penaeus monodon (Fabricius)
  A N Bart, S Choosuk and D P Thakur
- 529 Sex organ extracts and artificial hormonal compounds as sex pheromones to attract broodfish and to induce spawning of Chinese black sleeper (Bostrichthys sinensis Lacépède) W-S Hong, S-X Chen, Q-Y Zhang and W-Y Zheng

- 535 Effects of starvation and re-alimentation periods on growth performance and hyperphagic response of Sparus aurata E Orhan Tufan, K Metin and S Bans
- 538 Studies on the recently discovered crayfish, Austropotamobius torrentium (Shrank, 1803), in Turkey: morphological analysis and meat yield

M Mustafa Harlyıoğlu and U Güner

# Volume 37, Number 6, 20 April 2006

### **Original articles**

- 543 Swim-up fry production in the African Catfish Clarias gariepinus (Burchell) broodstocks fed with differently heated soybean-based diets A A Adewumi. V F Olaleve and E A Adesulu
- 550 Feeding and growth in captivity of the octopus Enteroctopus megalocyathus Gould, 1852 M C Pérez, D A López, K Aguila and M Luisa González
- 556 Polymorphic analysis of microsatellite DNA in wild populations of Chinese shrimp (Fenneropenaeus chinensis)
  P Liu, X Hong Meng, J Kong, Y Ying He and Q Yin Wang
- 563 Genetic diversity in a Tasmanian hatchery population of Atlantic salmon (Salmo salar L.) compared with its Canadian progenitor population B H Innes and N G Elliott
- 570 Modification of tissue fatty acid composition in Murray cod (Maccullochella peelii peelii, Mitchell) resulting from a shift from vegetable oil diets to a fish oil diet G M Turchini. D S Francis and S S De Silva
- 586 Feeding rhythm and growth of the tongue sole, Cynoglossus semilaevis Günther, during its early life stages M Ai-Jun, L Xue-Zhou, X Yong-Jiang, L You and Z Zhi-Meng
- 594 Influence of pond fertilization and feeding rate on growth performance, economic returns and water quality in a small-scale cage-cum-pond integrated system for production of Nile tilapia (Oreochromis niloticus L.)
  H Waidbacher, D M Liti, M Fungomeli, R K Mbaluka, J M Munguti and M Straif
- 601 Intensity and profitability of Clarias gariepinus nursing systems in periurban Yaoundé, Cameroon S Yong Sulem and R E Brummett
- 606 Effect of dietary echium oil on growth, fatty acid composition and metabolism, gill prostaglandin production and macrophage activity in Atlantic cod (Gadus morhua L.) J Gordon Bell, F Strachan, J E Good and D R Tocher
- 618 Pilot study on polyculture of juveniles spotted babylon, *Babylonia areolata*, with milkfish, *Chanos chanos*, to marketable sizes using large-scale operation of earthen ponds in Thailand S Kritsanapuntu. N Chaitanawisuti. W Santhaweesuk and Y Natsukari
- 625 Influence of storage conditions on viability of quiescent copepod eggs (Acartia tonsa Dana): effects of temperature, salinity and anoxia
  M Holmstrup, J Overgaard, T F Sørensen, G Drillet, B W Hansen, H Ramløv and K Engell-Sørensen
- 632 Effects of four egg desticking procedures on hatching rate and further survival and growth of larvae in the tench (*Tinca tinca L.*)
  J M Carral, J D Celada, M Sáez-Royuela, R Rodríguez, A Aguillera and P Melendre
- 637 Genetic variation of body size, condition and pyloric caeca number in juvenile brown trout, Salmo trutta L. J M Blanc and H Poisson

#### **Short communications**

- 643 Growth and survival of tongue sole (Cynoglossus semilaevis Günther, 1873) larvae fed a compound diet with different protein sources Q Chang, M Liang, J Wang, S Chen, X Zhang and X Liu
- 647 Endocytosis of indigenous bacteria and cell damage caused by Vibrio anguillarum in the foregut and hindgut of spotted wolffish (Anarhichas minor Olafsen) fry: an electron microscopical study E Ringø, H Mikkelsen, T Kaino, R Erik Olsen, T M Mayhew and R Myklebust

#### **Book Review**

- 652 Fish Genetics and Aquaculture Biotechnology M S Powell
- 654 Frratum

## Volume 37, Number 7,12 May 2006

### **Original articles**

- 655 Shape ontogeny and variation in the sharpsnout seabream, Diplodus puntazzo (Cetti 1777) S Kouttouki, E Georgakopoulou, P Kaspiris, P Divanach and G Koumoundouros
- 664 Combined effects of water exchange regimes and calcium carbonate additions on growth and survival of hatchery-reared juvenile spotted babylon (Babylonia areolata Link 1807) in recirculating grow-out system S Kritsanapuntu, N Chaitanawisuti, W Santhaweesuk and S Y Natsukari
- 671 Molecular systematics of bisexual Artemia populations L Hou, X Bi, X Zou, C He, L Yang, R Qu and Z Liu
- 681 Effect of high dietary intakes of vitamin E and n-3 HUFA on immune responses and resistance to Edwardsiella tarda challenge in Japanese flounder (Paralichthys olivaceus, Temminck and Schlegel) Z Wang, K Mai, Z Liufu, H Ma, W Xu, Q Ai, W Zhang, B Tan and X Wang
- 693 Evaluation of the progeny of third-generation Sydney rock oyster Saccostrea glomerata (Gould, 1850) breeding lines for resistance to QX disease Marteilia sydneyi and winter mortality Bonamia roughleyi J A Nell and B Perkins
- 701 Genetic relationship between broodstocks of olive flounder, Paralichthys olivaceus (Temminck and Schlegel) using microsatellite markers J-H Kang, J-K Noh, J-H Kim, J-H Lee, H-C Kim, K-K Kim, B-S Kim and W-J Lee
- 708 Growth of the abalone Haliotis diversicolor (Reeve) fed with macroalgae in floating net cage and plastic tank L Alcantara and T Noro
- 718 Growth of triploid oyster, Crassostrea madrasensis (Preston) J V Mallia, P Muthiah and P C Thomas
- 725 Growth and biometric relationships of the pearl oyster *Pinctada fucata* (Gould) on transplanting from the Gulf of Mannar to the Arabian Sea
  K S Mohamed, V Kripa, T S Velayudhan and K K Appukuttan
- 742 Therapeutic and prophylactic immunization against Streptococcus iniae infection in hybrid striped bass (Morone chrysops × Morone saxatilis)
  J J Evans, P H Klesius and C A Shoemaker

# Volume 37, Number 8,1 June 2006

- 751 Spawning induction in Kutum Rutilus frisii kutum (Kamenskii, 1901) using carp pituitary extract or GnRH analogue combined with metoclopramide S Dorafshan and F P Heyrati
- 756 Biochemical and technical observations supporting the use of copepods as live feed organisms in marine larviculture
  G Drillet, N O G Jørgensen, T F Sørensen, H Ramløv and B W Hansen
- 773 The inclusion of plant protein in cod diets, its effects on macronutrient digestibility, gut and liver histology and heat shock protein transcription
  A Computer Control of C
  - A-C Hansen, G Rosenlund, Ø Karlsen, P A Olsvik and G-I Hemre
- 785 Genetic variation of wild and cultured populations of the Kuruma prawn Marsupenaeus japonicus (Bate 1888) using microsatellites
  S Luan, J Kong and Q Y Wang
- 793 Use of biomass of the marine microalga Isochrysis galbana in the nutrition of goldfish (Carassius auratus) larvae as source of protein and vitamins P Coutinho, P Rema, A Otero, O Pereira and J Fábregas
- 799 Field evaluation of live chilling with CO<sub>2</sub> on stunning Atlantic salmon (Salmo salar) and the subsequent effect on quality
  B Roth, E Slinde and D H F Robb

- 805 Hypoxic conditions induce centrum defects in red sea bream Pagrus major (Temminck and Schlegel) Y Sawada, M Hattori, N Sudo, K Kato, Y Takagi, K Ura, M Kurata, T Okada and H Kumai
- 813 Optimization by orthogonal array design and humoral immunity of the bivalent vaccine against Aeromonas hydrophila and Vibrio fluvialis infection in crucian carp (Carassius auratus L.) A Li, W Yang, J Hu, W Wang, T Cai and J Wang
- 821 Effects of starvation on kidney melano-macrophage centre in olive flounder, Paralichthys olivaceus (Temminck and Schlegel)
  J W Hur. S R Woo, J H Jo and I-S Park
- 826 Pharmacokinetics of oxolinic acid in black tiger shrimp, Penaeus monodon Fabricius, and the effect of cooking on residues
  K Uno, T Aoki, W Kleechaya, L Ruangpan and V Tanasomwang
- 834 Effects of ascorbic acid enrichment by immersion of rainbow trout (Oncorhynchus mykiss, Walbaum 1792) eggs and embryos
  B Falahatkar, K Dabrowski, M Arslan and J Rinchard

- 842 Density-dependent mortality of the scallop *Chlamys farreri* (Jones & Preston) in grow-out culture *X Zhang, M Zhu, R Li, Z Wang, B Xia and L Zhang*
- 845 Erratum

## Volume 37, Number 9, 22 June 2006

- 847 Gustatory responses in Pacific bluefin tuna Thunnus orientalis (Temminck and Schlegel) J Kohbara, T Miyazaki, K Takii, H Hosokawa, M Ukawa and H Kumai
- 855 Acute tolerance of juvenile Florida pompano, *Trachinotus carolinus* L., to ammonia and nitrite at various salinities
  C R Weirich and M Riche
- 862 Effect of extender composition and freezing rate on post-thaw motility and fertility of Arctic char, Salvelinus alpinus (L.), spermatozoa N Mansour, G F Richardson and M A McNiven
- 869 Effects of formalin on water quality and parasitic monogeneans on silver perch (Bidyanus bidyanus Mitchell) in earthen ponds
  S J Rowland, M Nixon, M Landos, C Milsud, P Read and P Boyd
- 877 Thermal preference and tolerance of green abalone Haliotis fulgens (Philippi, 1845) and pink abalone Haliotis corrugata (Gray, 1828)
  F Díaz, A Denisse Re, Z Medina, G Re, G Valdez and F Valenzuela
- 885 Tagging of Litopenaeus vannamei (Boone) by uropod cutting: a comparison of two methods E M Leaño and I Chiu Liao
- 891 The effect of dietary inulin on aerobic bacteria associated with hindgut of Arctic charr (Salvelinus alpinus L.) E Ringø, S Sperstad, R Myklebust, T M Mayhew and R E Olsen
- 898 Seasonal shift in spawning of Atlantic cod (Gadus morhua L.) by photoperiod manipulation: egg quality in relation to temperature and intensive larval rearing T van der Meeren and V P Ivannikov
- 914 Dietary composition manipulation to enhance the performance of juvenile barramundi (*Lates calcarifer* Bloch) reared in cool water

  K C Williams, C G Barlow, L Rodgers and C Agcopra
- 928 A rapid bioassay for bactericides against the catfish pathogens Edwardsiella ictaluri and Flavobacterium columnare
  K K Schrader and M D Harries
- 938 Effect of water exchange on effluent and sediment characteristics and on partial nitrogen budget in semiintensive shrimp ponds in New Caledonia H Lemonnier and S Faninoz
- 949 Economic analysis of monosex culture of giant freshwater prawn (Macrobrachium rosenbergii De Man): a case study
  C Mohanakumaran Nair, K R Salin, M S Raju and M Sebastian

- 955 Cryopreservation of black ear catfish, Pangasius lamaudii, (Bocourt) sperm S Kwantong and A N Bart
- 958 Erratum

# Volume 37, Number 10, 20 July 2006

#### **Original articles**

- 959 Haematological and biochemical profile of harvest-size carp during harvest and post-harvest storage Z Svobodová, B Vykusová, H Modrá, J Jarkovský and M Smutná
- 966 Experimental co-culture of low food-chain organisms, Sabella spallanzanii (Polychaeta, Sabellidae) and Cladophora prolifera (Chlorophyta, Cladophorales), in Porto Cesareo area (Mediterranean Sea) C Pierri, G Fanelli and A Giangrande
- 975 Investigation of the nutritional requirements of Australian snapper Pagrus auratus (Bloch and Schneider 1801): digestibility of gelatinized wheat starch and clearance of an intra-peritoneal injection of p-glucose M A Booth, A J Anderson and G L Allan
- 986 Partial and complete replacement of fish meal by broad bean meal in feeds for Nile tilapia, Oreochromis niloticus, L., fry M M Gaber
- 994 Optimization of stocking density of freshwater prawn Macrobrachium rosenbergii (de Man) in carp polyculture in Bangladesh Md. A Hossain and M S Islam
- 1001 Daily activity pattern of the marine shrimp Litopenaeus vannamei (Boone 1931) juveniles under laboratory conditions
  C S Pontes, M de Fatima Arruda, A A de Lara Menezes and P P de Lima
- 1007 Dietary protein, growth, nutrient utilization and body composition of juvenile blackspot seabream, Pagellus bogaraveo (Brunnich)
  P Silva, C A P Andrade, V M F A Timóteo, E Rocha and L M P Valente
- 1015 Short- and long-term differences in growth, feed conversion efficiency and deformities in juvenile Atlantic cod (Gadus morhua) startfed on rotifers or zooplankton A K Imsland, A Foss, R Koediik, A Folkvord, S O Stefansson and T M Jonassen
- 1028 Microsatellite variability in natural populations of the blackspot seabream Pagellus bogaraveo (Brünnick, 1768): a database to access parentage assignment in aquaculture A Lemos, A I Freitas, A T Fernandes, R Gonçalves, J Jesus, C Andrade and A Brehm
- 1034 Combined effects of salinity and potassium concentration on juvenile mulloway (Argyrosomus japonicus, Temminck and Schlegel) in inland saline groundwater M S Doroudi, D S Fielder, G L Allan and G K Webster
- 1040 Frequent monitoring of temperature: an essential requirement for site selection in bivalve aquaculture in tropical-temperate transition zones M T Sicard, A N Maeda-Martínez, S E Lluch-Cota, C Lodeiros, L M Roldán-Carrillo and R Mendoza-Alfaro

## Short communication

1050 Hermophradite thinlip mullet Liza ramada (Risso, 1810) (Teleostei: Mugilidae) from Homa Lagoon (Izmir Bay-Aegean Sea)
B Bayhan and D Acarli

#### **Book review**

1053 Introduction à L'aquaculture M Verdegem

## Volume 37, Number 11, 15 August 2006

#### **Original articles**

1055 Influence of fish size and water temperature on the metabolic demand for oxygen by barramundi, Lates calcarifer (Bloch), in freshwater B D Glencross and M Felsing

- 1063 Effects of dietary squid viscera meal on growth and cadmium accumulation in tissues of Japanese seabass, Lateolabrax japonicus (Cuvier 1828)
  K Mai, H Li, Q Ai, Q Duan, W Xu, C Zhang, L Zhang, B Tan and Z Liufu
- 1070 Biochemical responses of matrinx\(\tilde{a}\) Brycon cephalus (G\(\tilde{u}\)nther, 1869) after sustained swimming A Hackbarth and G Moraes
- 1079 Effect of sublethal toxicity of some pesticides on growth parameters, haematological properties and total production of Nile tilapia (*Oreochromis niloticus* L.) and water quality of ponds M A Sweilum
- 1090 Effect of feeding level on growth and nutrient deposition in rainbow trout (Oncorhynchus mykiss Walbaum) growing from 150 to 600 g D P Bureau, K Hua and C Y Cho
- 1099 Growth, feed conversion efficiency and growth heterogeneity in Atlantic halibut (Hippoglossus hippoglossus) reared at three different photoperiods
  A K Imsland, A Foss, S O Stefansson, I Mayer, B Norberg, B Roth and M D Jenssen
- 1107 Rearing zebrafish (Danio rerio) larvae without live food: evaluation of a commercial, a practical and a purified starter diet on larval performance A P Carvalho, L Araújo and M M Santos
- 1112 Prevalence and serotyping of Listeria monocytogenes in Portuguese live bivalve molluscs sampled in various steps along the sanitary control process A L Pinto, P Teixeira, F Castilho, M T Felício, F Pombal and P A Gibbs
- 1117 Larval development in European hake (Merluccius merluccius L.) reared in a semi-intensive culture system R M Bielland and A B Skiftesvik
- 1130 Bacterial load reduction of live prey for fish larval feeding using Ox-Aquaculture 
  G Giménez, F Padrós, A Roque, A Estévez and D Furones
- 1140 Embryonic and larval development of honeycomb grouper Epinephelus merra Bloch I Jagadis, B Ignatius, D Kandasami and Md A Khan

1146 Stability of some commonly measured blood-chemistry variables in juvenile salmonids exposed to a lethal dose of the anaesthetic MS-222 J L Congleton

## Volume 37, Number 12,1 September 2006

- 1151 Genetic variability of Channa punctatus populations using randomly amplified polymorphic DNA M Nagarajan, M A Haniffa, A Gopalakrishnan, V S Basheer and A Muneer
- 1156 Morphological development of post hatch larval goldlined seabream Rhabdosargus sarba (Forskål, 1775)
  F S Ibrahim, K J Rana, J S Goddard and I S A Amri
- Improving growth performance and caudal fin stripe pattern in selected F<sub>6</sub>–F<sub>8</sub> generations of GIFT Nile tilapia (*Oreochromis niloticus* L.) using mass selection
  S-F Li, X-J He, G-C Hu, W-Q Cai, X-W Deng and P-Y Zhou
- 1172 Diel and ontogenetic body density change in Pacific bluefin tuna, Thunnus orientalis (Temminck and Schlegel), larvae
  T Takashi, H Kohno, W Sakamoto, S Miyashita, O Murata and Y Sawada
- 1180 Larval metamorphosis and morphological characteristic analysis of triploid shrimp Fenneropenaeus chinensis (Osbeck, 1765)
  F Li, C Zhang, K Yu, X Liu, X Zhang, L Zhou and J Xiang
- 1187 Cloning and characterization of tryptophan 2,3-dioxygenase gene of Zhikong scallop Chlamys farreri (Jones and Preston 1904)
  X Hu, Z Bao, J Hu, M Shao, L Zhang, K Bi, A Zhan and X Huang
- 1195 Evaluation of a novel pentaplex microsatellite marker system for paternity studies in Atlantic cod (Gadus morhua L.)
  M S Wesmajervi, J-I Westgaard and M Delghandi

- 1202 Physical and chemical characteristics of sediments in catfish, freshwater prawn and carp ponds in Thailand
  I Wudtisin and C E Boyd
- 1215 Evaluation of *Bacillus subtilis* as a probiotic to Indian major carp *Labeo rohita* (Ham.) R Kumar, S C Mukherjee, K P Prasad and A K Pal
- 1222 Isolation and characterization of pathogenic Vibrio alginolyticus from diseased postlarval abalone, Haliotis diversicolor supertexta (Lischke) J Cai, H Han, Z Song, C Li and J Zhou
- 1227 Use of marine yeasts as an available diet for mass cultures of *Moina macrocopa* C-K Kang, H Y Park, M-C Kim and W J Lee
- 1238 Growth response and acquired resistance of Nile tilapia, Oreochromis niloticus (L.) that survived Streptococcus iniae infection C A Shoemaker, C Lim, M Yildirim-Aksoy, T L Welker and P H Klesius
- 1246 Growth performance, morphometric traits and gonad development of induced reciprocal diploid and triploid hybrids between the mud loach (*Misgurnus mizolepis* Günther) and cyprinid loach (*Misgurnus anguillicaudatus* Cantor)

  I-S Park, Y K Nam and D S Kim

- 1254 Gross metabolic waste output estimates using a nutritional approach in Atlantic bluefin tuna (*Thunnus thynnus*) under intensive fattening conditions in western Mediterranean Sea F Aguado-Giménez, B García-García, M D Hernández-Lorente and J Cerezo-Valverde
- 1259 Stimulation of ovarian development and spawning in the giant freshwater prawn, Macrobrachium rosenbergii (de Man)
  S Tanboonteck, P Damrongphol and W Poolsanguan
- 1262 Comparative oxygen tolerance of pikeperch Sander lucioperca, Volga pikeperch S. volgensis and their hybrids S. lucioperca × S. volgensis
  T Müller, M Bódis and M Bercsényi
- 1265 Preliminary studies on bacterial diversity of cultured bluefin tuna *Thunnus thynnus* from the Adriatic Sea D Kapetanović, B Kurtović, I Vardić, D Valić, Z Teskeredžić and E Teskeredžić

# Volume 37, Number 13, 22 September 2006

- 1267 Effect of varying dietary lipid and protein levels on growth and reproductive performance of female swordtails Xiphophorus helleri (Poeciliidae) S Ling, R Hashim, S Kolkovski and A C Shu-Chien
- 1276 Efficacy of selection in sexually breeding Artemia (Artemia franciscana, Kellogg, 1906) M M Shirdhankar, P C Thomas and S K Barve
- 1282 Whole-body corticosteroid and plasma cortisol concentrations in larval and juvenile Atlantic cod Gadus morhua L. following acute stress W King V and D L Berlinsky
- 1290 Heat-shock protein70 gene expression in four hatchery Pacific Abalone Haliotis discus hannai Ino populations using for marker-assisted selection P Cheng, X Liu, G Zhang and Y Deng
- 1297 The effects of densities and feed types on the production of *Macrobrachium rosenbergii* (de Man) in the rotational rice—prawn system
  L M Lan, D N Long and J-C Micha
- 1305 Certain reproductive characteristics of the freshwater mussel *Unio terminalis delicates* (Lea, 1863) in Gölbaşı Lake, Turkey \$\mathcal{S}\$ Cek and \$H\$ Sereflişan
- 1316 Effect of hypo- and hyper-saline conditions on osmolarity and fatty acid composition of juvenile shrimp Litopenaeus vannamei (Boone, 1931) fed low- and high-HUFA diets M A Hurtado, I S Racotta, O Arjona, M Hernández-Rodríguez, E Goytortúa, R Civera and E Palacios
- 1327 Growth and oxygen consumption of the juvenile sea cucumber Apostichopus japonicus (Selenka) at constant and fluctuating water temperatures Y Dong and S Dong

- 1334 Over-wintering growth of Macrobrachium rosenbergii (de Man) with carp polyculture in Bangladesh fed formulated diets
  M A Hossain and A S M Kibria
- 1341 Karyological analysis of endangered Caspian salmon, Salmo trutta caspius (Kessler, 1877) M R Kalbassi, S Dorafshan, T Tavakolian, M Khazab and H Abdolhay
- 1348 Nutritive value of partially dehulled and extruded sunflower meal for post-smolt Atlantic salmon (Salmo salar L.) in sea water
  N Gill, D A Higgs, B J Skura, M Rowshandeli, B S Dosanjh, J Mann and A L Gannam
- 1360 Effect of using different types of organic animal manure on plankton abundance, and on growth and survival of *Tilapia rendalli* (Boulenger) in ponds J Kang'ombe, J A Brown and L C Halfvard
- 1372 Growth performance and energetic metabolism of pacu, Piaractus mesopotamicus (Holmberg, 1887), fed diets supplemented with ammonium metavanadate L. S. Takahashi, A. P. Baldan and E. C. Urbinati

- 1378 Effect of thyroxine immersion on larval survival, growth and postlarvae production of freshwater prawn, Macrobrachium rosenbergii (de Man) P Roustaian and L A Gaik
- 1381 Effect of tank size on food intake and growth in individually held juvenile rainbow trout Oncorhynchus mykiss (Walbaum)
  T Banta and J Pirhonen

## Volume 37, Number 14, 20 October 2006

- 1387 Effects of water exchange and abiotic factors on zooplankton and epibenthic fauna in shrimp ponds F E Coman, R M Connolly and N P Preston
- 1400 Isolation and culture of the marine rotifer, Colurella dicentra (Gosse, 1887), from a Mississippi Gulf Coast estuary
  P Chigbu and V A Suchar
- 1406 Daily variation in short-term static toxicity of unionized ammonia in *Litopenaeus vannamei* (Boone) postlarvae
  F M Barajas, R S Villegas, G P Clark, J G Mosqueda and B L Moreno
- 1413 Effect of different food items on the survival and growth of Farfantepenaeus paulensis (Pérez-Farfante 1967) postlarvae R Soares, S Peixoto, W Wasielesky and F D'Incao
- 1419 Reducing aggression between freshwater crayfish (Cherax destructor Clark: Decapoda, Parastacidae) by increasing habitat complexity
  H P Baird, B W Patullo and D L Macmillan
- 1429 Panagrellus redivivus mass produced on solid media as live food for Litopenaeus vannamei larvae U Focken, C Schlechtriem, M von Wuthenau, A García-Ortega, A Puello-Cruz and K Becker
- 1437 Genetic variation of Rutilus rutilus caspicus (Jakowlew 1870) populations in Iran based on random amplified polymorphic DNA markers: a preliminary study S Keyvanshokooh and M R Kalbassi
- 1441 Effects of temperature on growth of juvenile blackfoot abalone, Haliotis iris Gmelin T Searle, R D Roberts and P M Lokman
- 1450 Cryopreservation of sea cucumber Apostichopus japonicus (Selenka) sperm M Y Shao, Z F Zhang, L Yu, J J Hu, and K H Kang
- 1458 Light intensity effects on early life stages of black sea bass, Centropristis striata (Linnaeus 1758) K A Copeland and W O Watanabe
- 1464 Sex differences in circulating steroid hormone levels in the red drum, Sciaenops ocellatus L. W D Kucherka, P Thomas and I A Khan
- 1473 Effect of dietary probiotic Biogen supplementation as a growth promoter on growth performance and feed utilization of Nile tilapia Oreochromis niloticus (L.) E R EL-Haroun, A M A-S Goda and M A K Chowdhury
- 1481 Additive, dominance genetic effects for growth-related traits in common carp, Cyprinus carpio L. C-H Wang, S-F Li, S-P Xiang, J Wang, Z-G Liu, Z-Y Pang, J-P Duan and Z-B Xu

- 1487 Quality improvement by feeding wild-caught edible crab (Cancer pagurus L.): a pilot study A K Woll, G I van der Meeren and S Tuene
- 1497 Erratum

# Volume 37, Number 15,15 November 2006

# **Original articles**

- 1499 Production and yield of *Penaeus semisulcatus* (de Haan) cultured at different densities A A Al-Ameeri and E M Cruz
- 1507 Growth and performance of *Penaeus semisulcatus* (de Haan) fed with two commercial shrimp feeds A A Al-Ameeri, E M Cruz and T Al-Sharrah
- 1516 Developing the harpacticoid copepod Tisbe biminiensis culture: testing for salinity tolerance, ration levels, presence of sediment and density dependent analyses
  L P Souza-Santos, J M O Pastor, N G Ferreira, W M Costa, C M V Araújo-Castro and P J P Santos
- 1524 Survival, growth and biochemical parameters of silver catfish, Rhamdia quelen (Quoy & Gaimard, 1824), juveniles exposed to different dissolved oxygen levels N Braun, R L de Lima, B Moraes, V L Loro and B Baldisserotto
- 1532 Optimum digestible protein and energy levels and ratio for greater amberjack Seriola dumerili (Risso) fingerling F Takakuwa, H Fukada, H Hosokawa and T Masumoto
- 1540 Pharmacokinetics of chloramphenicol in carp (*Cyprinus carpio* L.) after drug administration *Z-Y Huang, M-Y Sun, S Li and G-L Huang*
- 1546 Refined understanding of sulphur amino acid nutrition in hybrid striped bass, Morone chrysops ♀ × M. saxatilis ♂
  M Kelly, B Grisdale-Helland, S J Helland and D M Gatlin III
- 1556 Effects of pre-rigor filleting on quality aspects of Atlantic cod (Gadus morhua L.)
  S Kristoffersen, T Tobiassen, M Esaiassen, G B Olsson, L A Godvik, M A Seppola and R L Olsen
- 1565 Ontogenic development of the digestive enzymes in common pandora, *Pagellus erythrinus*, L. larvae *C Suzer, K Fırat and Ş Saka*
- 1572 Light intensity preference of juvenile pikeperch Sander lucioperca (L.) A C Luchiari, F A de Morais Freire, J Koskela and J Pirhonen
- 1578 A set of highly polymorphic microsatellites useful for kinship and population analysis in turbot (Scophthalmus maximus L.)
  B G Pardo, M Hermida, C Fernández, C Bouza, M Pérez, A Llavona, L Sánchez and P Martínez
- 1583 Environmental sex determination, external sex differentiation and structure of the androgenic gland in the Pacific white shrimp *Litopenaeus vannamei* (Boone)

  R Campos-Ramos, R Garza-Torres, D A Guerrero-Tortolero, A M Maeda-Martínez and H Obregón-Barboza

## **Short communications**

- 1594 Growth and nutrient removal rates of Spirulina platensis and Nostoc muscorum in fish culture effluent: a laboratory-scale study D Kamilya, S Sarkar, T K Maiti, S Bandyopadhyay and B C Mal
- 1598 A simple PCR-RFLP method for the discrimination of native and introduced oyster species (Crassostrea brasiliana, C. rhizophorae and C. gigas; Bivalvia: Ostreidae) cultured in Southern Brazil M R Pie, R O Ribeiro, W A Boeger, A Ostrensky, R M Falleiros and L Angelo
- 1601 Paralarval rearing of the common octopus, Octopus vulgaris (Cuvier) J F Carrasco, J C Arronte and C Rodríguez
- 1606 Diel fluctuation of soluble phosphorus in the tank water of rainbow trout, *Oncorhynchus mykiss* (Walbaum), and relationships with feed inputs and dissolved oxygen *G K Reid and R D Moccia*

## Volume 37, Number 16,1 December 2006

#### **Original articles**

1611 Development of embryos in Mastacembelus mastacembelus (Bank & Solender, 1794) (Mesopotamian spiny eel) (Mastacembelidae)
E Şahinöz, Z Doğu and F Aral

- 1617 Assessment of impact of aquaculture on Kolleru Lake (India) using remote sensing and Geographical Information System
  M Jayanthi, P N Rekha, N Kavitha and P Ravichandran
- 1627 Effect of salinity on carrying capacity of adult Nile tilapia Oreochromis niloticus L. in recirculating systems M A Kabir Chowdhury, Y Yi, C K Lin and E R El-Haroun
- 1636 Characterization of haemocytes of the Indian edible oyster, Crassostrea madrasensis (Preston)
  G Ittoop, K C George, N K Sanil, R M George, K S Sobhana and P C Nisha
- 1644 The effect of dietary krill supplementation on epithelium-associated bacteria in the hindgut of Atlantic salmon (Salmo salar L.): a microbial and electron microscopical study E Ringø, S Sperstad, R Myklebust, T M Mayhew, A Mjelde, W Melle and R E Olsen
- 1654 Mono- and duoculture of juvenile sharpsnout seabream Diplodus puntazzo (Cetti) and gilthead seabream Sparus aurata L. in a recirculated water system N Karakatsouli, P Papafotiou and S E Papoutsoglou
- 1662 Effect of Artemia enrichment on the growth and survival of Pacific bluefin tuna Thunnus orientalis (Temminck & Schlegel) larvae A K Biswas, J Nozaki, M Kurata, K Takii, H Kumai and M Seoka
- 1671 Verification of ploidy level in sturgeon larvae D Fopp-Bayat and P Woznicki
- 1676 Effect of Antarctic krillmeal on quality of farmed Atlantic cod (Gadus morhua L.)

  Ø Karlsen, J Suontama and R E Olsen
- 1685 Effect of acclimation temperature on the acute stress response in juvenile Atlantic cod, Gadus morhua L., and haddock, Melanogrammus aeglefinus L.
  W King V, L J Buckley and D L Berlinsky

- 1694 Scylla paramamosain (Estampador) the most common mud crab (Genus Scylla) in China: evidence from mtDNA L-B Ma, F-Y Zhang, C-Y Ma and Z-G Qiao
- 1699 Polymorphism of the lysyl oxidase gene in relation to muscle collagen cross-link concentration in Atlantic salmon S Consuegra and I A Johnston
- 1703 Fertilization success and early survival in pure and hybrid larvae of Mytilus edulis (Linnaeus, 1758) and M. trossulus (Gould, 1850) from laboratory crosses J E Toro, R J Thompson and D J Innes